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COORDINATION OF PROGRAMMES WITHIN THE UNITED NATIONS SYSTEM IN THE FIELD OF NATURAL RESOURCES

Activities of the United Nations system in water, mineral and energy resources

Report of the Secretary-General

SUMMARY

1. In its resolution 1989/12 of 22 May 1989, the Economic and Social Council requested the Secretary-General to submit to the Committee on Natural Resources at its twelfth session an updated report containing an overview of activities of the United Nations in water, mineral and energy resources, identifying the organizations or units within the United Nations system which are mandated to carry out work in those fields, and assessing the extent to which the guidelines for action in the field of natural resources, adopted by the Committee on Natural Resources at its second session, in 1972, have been followed. 1/ The Council also requested the Secretary-General to identify in the report the existing priorities and objectives for the work of the United Nations system in the field of natural resources.

2. In resolution 1989/11 of 22 May 1989, the Council further called upon the Secretary-General to include in the above-mentioned report a section on the activities of the organizations of the United Nations system bearing upon the impact of financial constraints affecting developing countries in the development, conservation and maintenance of their natural resources and related infrastructures.

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* E/C.7/1991/1.

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3. In implementing the resolutions of the Council, the present report was prepared on the basis of replies to a questionnaire circulated to all organs and units within the United Nations system with the request that they update the information contained in the previous report of the Secretary-General on the subject (E/C.7/1989/9) regarding their objectives and priorities in the field of natural resources and their regular as well as extrabudgetary allocations for the biennium 1990-1991. They were further requested to provide information on their activities pertaining to the impact of financial constraints affecting natural resource development and conservation and to transmit their views on ways and means for improving coordination in the field of natural resources within the United Nations system. The present report is accordingly divided into three sections corresponding to these subjects.

I. OVERVIEW OF ACTIVITIES

4. The objectives and priorities of the organs and units of the United Nations system in water, mineral and energy resources are reflected in tables 1, 3 and 5 respectively; their budgetary allocations, both regular and extrabudgetary, are also indicated for the bienniums 1988-1989 and 1990-1991. Tables 2, 4 and 6 show the involvement of the organs and units of the United Nations system in the priorities outlined for each sector by the 1972 Guidelines; in the 1977 Mar del Plata Action Plan; 2/ in the International Drinking Water Supply and Sanitation Decade, launched in 1980; 3/ and in the Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy, 4/ adopted in 1981, which elaborated on the Guidelines in their respective areas of concern. Tables 2, 4 and 6 also summarize all activities reported for the biennium 1990-1991 and describe the manner in which these activities are being implemented.

5. Following a review of the activities of the various organs and units of the system in natural resources, it was found, as was the case with the previous assessment of the Secretary-General contained in document E/C.7/1989/9, that these activities followed the priorities set out in the above-mentioned legislative instruments. It should be noted, however, that the objectives and priorities of the organs and units mostly concerned have been adjusted in the light of emerging new global issues and concerns within the international community. Such is the case for example for a number of entities that have placed greater emphasis on the need for rational management and use of natural resources within the broad context of sustainable development and concern for the environment.

II. IMPACT OF FINANCIAL CONSTRAINTS

6. Many developing countries have only limited financial resources for investment and development. As reported by the responding organs, the adverse economic climate and prevailing conditions of the 1980s have placed further financial constraints on the development, conservation and maintenance of natural resources in developing countries.

7. Although more detailed assessments are needed, there is accumulated evidence that there has been a reduction in financial resources allocated to the water resources sector. Most of the funding appears to be directed towards rehabilitation of existing systems, a clear indication that maintenance of existing systems is less than satisfactory. Regional assessments provide a more detailed picture of the situation. A 1989 survey carried out by the Economic and Social Commission for Asia and the Pacific (ESCAP) shows that for a majority of the member States and territories of the region, shortages of financial resources have significantly constrained the implementation of their programmes relating to water resources assessments, natural disaster mitigation, irrigated agriculture, education and training of water resources personnel at various levels and research and development programmes. A more recent study conducted by the Economic Commission for Latin America and the Caribbean (ECLAC) indicates that levels of investment in water-related projects have been seriously affected by the general economic recession prevailing in the region. The effect of the reduced availability of resources has been to curtail both new capital investment and the maintenance of existing systems. The recession has also contributed to the unstable financial situation of the many water resource projects and public utilities and has underlined their inability to ensure an adequate tariff base. This situation has led to increased dependence on the use of general government revenues to fund water-related investment. Where long-term objectives and priorities have not been clearly established, all too often this has meant that scarce budget resources have become increasingly thinly spread across a growing number of projects, thus failing to address the problems attending constraints on this sector's development. 5/

8. A noticeable trend, in addition to the decreasing level of allocations to the water resources sector, is that fewer large dams are being constructed. There is a subsequent growing interest in small-scale water resources development, particularly for irrigation. However, a problem that is taking a new dimension is the deterioration in water quality of both surface water and groundwater, which is restricting water use in many instances and is often responsible for the degradation of agricultural land. There is a growing need for increased funding for monitoring water quality in order to identify the responsible pollutants so that timely remedial action can be taken and more severe consequences avoided.

9. In the developing countries, mineral resources development programmes are of particular importance for rapid economic growth. However, financial constraints have made it difficult for those countries to obtain credit for developing and maintaining their natural resources. The main option for most Governments has been to encourage foreign investment by establishing a stable and market-oriented environment. This underlines the importance of providing developing countries with extensive investment advisory services covering all aspects of mineral investment, including advice to Governments on the design of their fiscal policies which could prove both attractive to investors and acceptable to Governments. In this period of financial constraint, national mining companies have become an important source of revenue for both economic development and for servicing the national debt. In view of the important role that national mining companies have assumed, profitability becomes a critical factor in the financial future of the mineral-exporting developing countries. Providing assistance to Governments for

the reorganization and rehabilitation of State mining enterprises to improve their efficiency and profitability is therefore another important element to be taken into account.

10. In the energy sector, the exploration and development of indigenous energy resources require investments that more often than not, are beyond the financial means of developing countries. Additional assistance and activities may be required to support efforts to attract international financing and investment for development of energy resources in those countries. Recent increases in the price of oil may renew interest in alternative energy resources. Transnational oil companies have been reducing their exploration programmes in a number of energy deficient developing countries which, faced with high debt burdens and stagnant export markets, are not in a position to finance large-scale energy exploration and development programmes. Several developing countries have or are in the process of revising legal and contractual arrangements to provide a further inducement to attract foreign capital for investment in the energy sector. While energy conservation and efficiency are objectives widely appreciated in many developing countries, many of them are limited to low capital cost initiatives owing to financial constraints. Most developing countries are not now in a financial position to take measures that may be required, for example, in ameliorating the depletion of the ozone layer. These issues will be addressed in 1992 by the United Nations Conference on Environment and Development.

III. COORDINATION MATTERS

11. Since the adoption of the Mar del Plata Action Plan, the activities carried out by the various organs and units of the system in water use and supply have been coordinated by the Administrative Committtee on Coordination (ACC) Intersecretariat Group for Water Resources. A Steering Committee for Cooperative Action for the International Drinking Water Supply and Sanitation Decade, chaired by the Deputy Administrator of the United Nations Development Programme (UNDP), provides for coordinated action specifically related to the Decade. Recently, with the financial support of UNDP, regional analyses of progress and issues in the implementation of the Mar del Plata Action Plan were conducted with the full cooperation of the regional commissions and other members of the Intersecretariat Group, with a view to formulating proposals for a strategy for the 1990s. Work is being undertaken by the organizations members of the Group for the preparation of an International Conference on Water and the Environment, to be convened by the World Meteorological Organization (WMO) on behalf of the ACC Intersecretariat Group in Dublin, Ireland, in January 1992, as part of the preparatory process for the United Nations Conference on Environment and Development. The ACC Inter-Agency Group on New and Renewable Sources of Energy assists in the coordination of United Nations activities in that field. More policy-oriented coordination is provided by a steering committee under the chairmanship of the Director-General for Development and International Economic Cooperation. There is no formal coordination mechanism for minerals and overall energy; however, a measure of coordination in those fields is achieved in the planning and programming of activities and through exchanges of programme budget documents and ad hoc consultations among the various organizations involved.

12. A number of proposals were made by the organs and organizations consulted in preparing the present report on ways and means to improve coordination within the United Nations system, particularly with reference to programmes in the fields of mineral and energy resources. With respect to the energy sector, one organization pointed out that the mechanism of the Inter-Agency Group on New and Renewable Sources of Energy was too narrow in substantive focus to deal with the scope of problems facing developing countries in the energy sector and the totality of activities undertaken by the various organizations and agencies of the United Nations system aimed at redressing those problems. If other organizations and agencies concurred, it might be advisable to create a broader inter-agency energy group, which would cover the entire spectrum of issues in the energy sector, including all sources of energy. Regarding the mineral resources sector, more formalized mechanisms for coordinating activities of the system in that area might also be considered. Alternatively, another organization felt that bearing in mind the need to prevent the proliferation of coordinating bodies, it might be appropriate to adopt the same approach for the coordination of agency activity as was used in the Committee on Natural Resources for policy matters and establish accordingly a group with regional subgroups to coordinate activities in the energy, mineral and water sectors. In that connection one organization recommended that activities related to natural resources should be coordinated with environmental issues, as natural resources were the main pillars of environment and their misuse a cause of ecological imbalances. In general, that would imply an improvement of coordination at an early stage for environmentally sound development.

13. The Secretary-General would welcome the observations of the Committee on Natural Resources on this as well as other proposals it might find relevant, as it is the intention of the Secretary-General to continue his consultations with a view to ascertaining the need for and modalities of inter-agency coordination in the area of natural resources.

Notes

1/ See Official Records of the Economic and Social Council, Supplement No. 5 (E/5097), chap. III, sect. A.

2/ Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977 (United Nations publication, Sales No. E.77.II.A.12), chap. I.

3/ Proclaimed by the General Assembly in resolution 35/18.

4/ Report of the United Nations Conference on New and Renewable Sources of Energy, Nairobi, 10-21 August 1981 (United Nations publication, Sales No. E.81.I.24), chap. I, sect. A.

5/ Economic Commission for Latin America and the Caribbean document LC/R.904, dated 11 July 1990, p. 53.

Table 1. Objectives, priorities and budgetary allocations concerning water resources

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
DIESA	Review progress made by Governments and by the organizations of the United Nations system in the implementation of the Mar del Plata Action Plan, and to promote systemwide coordination.	Formulation of proposals for a strategy for the implementation of the Action Plan in the 1990s in consultation with the organizations of the system.	RB XB	273.0 10.0	406.8 12.0
DTCD	To foster the application of new and more efficient concepts and methods for water resources planning, management, legislation and administration. To promote optimum use of technology in river basin and coastal area development through the application of integrated systems for the efficient use, re-use and disposal of surface and groundwaters.	Acceleration of activities geared to the welfare of rural populations. Increase in the proportion of the Department's rational management and use of water resources within the context of sustainable development and environmental concerns, training of supervisory and maintenance personnel, and assistance in the preparation of projects for bilateral and multilateral financing.	RB XB	510.5 44 067.0	3 268.6 62 396.0
ECA	To assist countries and territories in the region in acquiring a knowledge base of surface and groundwater resources and in developing institutional capabilities for the appropriate exploitation of their water resources.	Support in the development and management of water resources at national and subregional levels; promotion of information exchange among member States.	RB XB	508.2	
ECE a/	To continue developing strategies, policy recommendations and multilateral instruments of a legally binding character on selected water management problems aiming at the protection, sustainable use and conservation of water resources including transboundary waters.	Elaboration of a framework convention on the protection and use of transboundary water courses and international lakes; development of a concept of responsibility and liability regarding trans-boundary water pollution including guidelines for Governments; elaboration of recommendations to ECE Governments on: Ecosystems approach to water management; water-quality objectives and criteria; water-quality classification; eutrophication control; control of water pollution owing to agriculture.	RB XB		
ECLAC	Development and efficient use of water resources in the region, facilitation of cooperation, and ensuring the implementation of the Mar del Plata Action Plan; make operational information systems on water resources development activities; identification and promotion of cooperation on training programmes concerning new techniques for water management.	Management of complex water systems, improved management of Andean watersheds, rural water supply and sanitation.	RB XB	523.0 85.0	445.9 55.0
ESCAP	Formulation and implementation of plans and programmes for the proper assessment, development, efficient use and management of water resources, including damage mitigation from water-related natural disasters; to support national economic and social development plans.	Support for the implementation of the Mar del Plata Action Plan, promotion of regional cooperation for water resources development, provision of information and training for water resources development.	RB XB	967.2 657.0	921.0 542.0
ESCWA b/	Promotion of efficient management, planning and conservation policies aimed at the achievement of water security, and at the objectives of International Drinking Water Supply and Sanitation Decade.	Promotion of water security in the region; achievement of the goals and objectives of the International Drinking Water Supply and Sanitation Decade.	RB XB	471.8 115.3	
UNEP	To help Governments to reconcile conflicting interests of regional development and the water-related environment in whole water systems; to promote the extended use of environmental management methods and techniques for vector control within water resources development programmes.	Development and implementation of action plans for the environmentally sound development of fresh water resources in the case of national and international basins.	RB XB	2 720.0	 3 400.0

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Table 1 (continued)

Organization	Objectives	Priorities	Budgetary resources (Thousands of dollars)	1988-89	1990-91
UNCHS	Promotion of the development of standards and technologies for the provision of economically efficient infrastructure; and to assist Governments in maintaining supply and keeping down the cost of water provided to urban areas.	Water conservation as a fundamental strategy in improving and increasing existing community water supplies and development of policies and techniques for the environmental management of water resources to meet large urban demands.	RB XB	125.0 25.0	222.6 1 061.1
UNDP	To design, implement and evaluate water supply and waste management projects; to conduct operational research in such areas as local manufacturing of water facilities (e.g., handpumps), borehole design and construction; cost recovery; management, operation and maintenance; human resources development. In addition, UNDP (OPS) executes a number of projects concerning various aspects of water resources development under specific conditions.	To design, implement and evaluate water supply and waste management projects; to conduct operational research in such areas as local manufacturing; borehole design and construction; cost recovery; management, operation and maintenance; human resources development.	8 372.0 (From IPF)		
CDF	To design, finance and monitor irrigation and water supply projects to promote economic activity and to meet basic needs of primarily low-income groups in the LDCs. Installation of infrastructure, provision of equipment, community development, revolving funds, cost-recovery schemes.	Irrigation with land, river bank protection. Rural water supply and sanitation. Community participation and national capacity development in implementation.	RB	41 739.0 c/	
WFP d/, e/	To support with food aid government efforts in water resources development and utilization (such as irrigation and safe water supplies).	Watershed management (soil and water conservation, measures to reduce uncontrolled run-off and to improve water use); irrigation (increase cropping intensity and yields); drinking water supply (for consumption by people or livestock).	251 483.0		309 291.0
UNICEF	To improve the health of children through the provision of safe water supply and sanitation to urban poor and rural areas.	Advice to and consultations with communities; training of national staff; supply of equipment and of materials for wells, simple gravity schemes, and latrines; provision of master well-drillers and other technical support; enhancement of community participation.	RB XB	56 000.0 84 000.0	
UNDRO	Mobilization and coordination of international relief assistance for disasters caused by waters (floods, cyclones, mudflows, tsunamis, etc.), provision of assistance for preparedness and prevention concerning water-related disasters.	Disaster relief assistance; disaster preparedness covering such areas as forecasting and warning systems, as well as structural and non-structural measures designed to avert or withstand disasters.	RB XB		
INSTRAW	To cooperate with other United Nations organizations in programmes to enhance the role of women in water supply and sanitation; expand the training activities and the scope of modular training packages on "women, water supply and sanitation" for use at the national and the community levels field programmes.	Continue activities to enhance the role of women in water supply and sanitation in accordance with the objectives of the Decade and Collaborative Council; update with DTCD training packages on "women, water supply and sanitation"; continue to conduct national training seminars on women, water supply and sanitation; promote the dissemination of the training packages.	RB XB	130.0	10.0 30.0

Table 1 (continued)

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
ILO	Although the ILO is not an agency working directly in the field of water resources, it contributes within the framework of its traditional functions concerning management and vocational training programmes, and safety and working conditions. It is also contributing to water supply and irrigation schemes through its special public works programme which aims at generating employment through the construction of rural infrastructure. Design of affordable and labour-based technologies for community-based implementation in water supply and sanitation.	Management of development programmes (water supply and sanitation services, public utilities), short- and long-term employment generating programmes (such as irrigation, water supply, river bank protection), vocational training activities, within the framework of larger human resources development programmes. Support to communities of urban slum areas in upgrading water supply and sanitation infrastructures.	XB	8 500.0	9 200.0
FAO	Continued quantification of available land and water resources and assessment of their optimum physical utilization, with emphasis on water resources and irrigation potentials, and on assistance to integrated land use planning, including training on the utilization of data at national levels; enhancing performance and efficiency of water pumping, storage, and operational improvement of irrigation systems; assistance in the formulation and implementation of national irrigation policies, strengthening capabilities for planning, implementation and evaluation, including a balancing of the roles of irrigation and rainfed production; halting degradation of soil and water resources through planning and implementation of resource-based management strategies, preparation of guidelines for the use of water of marginal quality, and study of health and environmental aspects of land and water development.	Providing assistance in the quantification and assessment of water resources; rehabilitation of existing schemes, small-scale irrigation development, improvement of irrigation practices and better management systems; increased use of groundwater and increased training at all levels; identification of gaps in available technologies, knowledge and experience, adaptation to local condition, selection of appropriate technologies involvement of women in irrigated agriculture, participation of farmers; selection of equipment, repair, maintenance and servicing requirements, and operational training; formulation of measures to halt and reverse soil and water degradation, including reclamation of salt-affected soils and use of water of marginal quality and waste water, attention to health and environmental aspects of water development.	RB XB	5 378.0 31 000.0	5 850.0 26 165.0
UNESCO	Improve the understanding of hydrological processes; develop scientific and technical knowledge needed for the assessment, planning and management of water resources; development and improvement of education of specialists and higher technicians.	Increase the capacity of member States to assess, plan and manage their water resources rationally; improve the scientific, technical and management tools for water resources and hydrological studies; improve knowledge about the impact of natural and man-made changes on water resources.	RB XB	5 374.6 2 490.6	4 835.1 2 500.0
WHO	To promote the protection of human health through the provision of safe drinking and adequate sanitation by fostering national and international action for the implementation of programmes in the context of the International Drinking Water Supply and Sanitation Decade; to prevent risks to human health from adverse effects of environmental pollution; to promote the environmental management for diseases vector control, in particular health safeguards incorporated in irrigation and water resources projects.	Increase awareness of the importance of safe water and adequate sanitation within the overall concept of primary health care, and the need to adopt policies that maximize health benefits; enhancement of information exchange and technology development to reduce cost, use local materials and improve operation and maintenance; mobilization of financial resources; development of human resources; assist in the formulation of national policies and programmes for the prevention of environmental pollution of drinking water supply and water courses; continuation of promotional activities of the Panel of Experts on Environmental Management for Vector Control (PFEM), and strengthening of its network of collaborating centres.	RB XB	25 000.0 19 900.0	25 000.0 19 900.0

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Table 1 (continued)

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
WMO	To ensure the assessment and forecasting of the quantity and quality of water resources both for different uses or for hazard mitigation. Assistance to countries to enable them to assess their water resources and respond to threats of floods and droughts, and thus meet all requirements for water use and its management.	Evaluation of water resources through coordinated establishment of hydrological networks and services, including data collection and processing, hydrological forecasting and warnings, and the supply of meteorological and hydrological data for design purposes.	RB XB	3 200.0 9 870.0	
UNIDO f/	Studies on the use of water in industry.	Generally activities are an integral part of projects with industries.	RB XB		44.1 380.0
IAEA g/, h/	Provision of assistance to Governments on the application of isotope hydrology, provision of analytical services through the agency's laboratory. Coordination of research on the development of mathematical models for quantitative evaluation of isotope data in hydrological systems. Use of isotope methods in investigations related to aquifer vulnerability to pollution and in geothermal systems.	Technology transfer in isotope applications for hydrological purposes; strengthening of analytical capabilities of member States, and manpower training; research on the use of isotopes in water pollution and geothermal isotope data in hydrological systems.	RB XB		4 000.0
WORLD BANK i/, j/	World Bank activities are primarily directed at lending for the design and execution of water development projects. Some technical assistance and studies may be included as part of the financial packages. Under certain circumstances it serves as executing agency for UNDP projects.	World Bank loans and IDA credits are devoted primarily to irrigation, water supply and sanitation, and hydropower development.	WB IDA UNDP(IPP)	1 922 615 449 000 18 235.6	
IFAD	Provision of loans for irrigation as part of multi-component agricultural development projects.	Emphasis on low-cost small-scale irrigation and people's participation in small-scale irrigation.			

a/ Regular programme budgetary resources for water are an integral part of the environment programme of FCF.

b/ Extrabudgetary resources shown for 1988-89 represent expectations.

c/ CDF figures represent the value of projects and grant increases approved for these periods on the basis of declared government priorities.

d/ Figures for 1986-87 represent the total value of the water resources component of WFP projects approved in 1986.

e/ Figures for 1988-89 represent the total estimated value of water resources component of WFP projects approved in 1988.

f/ UNIDO's budgetary allocations for water are an integral part of industrial development projects.

g/ IAEA's figures are for the periods 1987-88 and 1989-90.

h/ IAEA's extrabudgetary resources for 1989-90 are not yet available.

i/ 1988-89 figures indicate disbursements for WB loans and IDA credits for 1988 only.

j/ UNDP(IPP) figures indicate disbursements on UNDP financed technical cooperation activities executed by the World Bank.

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Table 2. Involvement of the United Nations system in water resources a/

Major component of the Mar del Plata Action Plan	Data gathering, dissemination, reports to intergovernmental bodies, studies, publications	Meetings, conferences, symposia, seminars, workshops, expert groups	Technical cooperation activities	Resource transfers
1. Monitoring follow-up to the Mar del Plata Action Plan	UNDIESA, UNDTCD, ECA, ECLAC, ESCAP	DTCD, ECA		
2. Water planning, policy formulation, legislation and administration, including shared water resources	DTCD, ECA, ECE, ECLAC, ESCAP, ESCWA, UNEP, UNESCO, World Bank, FAO, UNCHS	DTCD, ECA, ECE, ECLAC, ESCWA, UNEP, UNESCO, World Bank, FAO, UNCHS	DTCD, ESCAP, FAO, UNEP, UNESCO, World Bank, UNDP, UNCHS	World Bank, UNDP, UNEP
3. Water resources assessment (collection, processing, storage and dissemination of atmospheric, surface and groundwater data and application of remote sensing techniques)	ESCAP, ESCWA, UNESCO, WMO, IAEA, FAO, UNEP	ECE, ESCAP, FAO, UNESCO, WMO, IAEA, UNEP	DTCD, ESCAP, FAO, UNESCO, WMO, IAEA, UNEP	World Bank, UNDP, UNEP
4. Education and training (institutions and curricula), staffpower needs	ECLAC, INSTRAW, UNESCO, FAO, ILO, WMO, UNEP, UNCHS	ECLAC, ESCAP, ESCWA, INSTRAW, UNESCO, WMO, UNEP, UNCHS	ECLAC, ESCAP, INSTRAW, UNESCO, ILO, FAO, WHO, UNEP, UNCHS	World Bank, UNDP, UNEP
5. Public participation and participation of women	INSTRAW, FAO, WHO, UNEP, UNESCO, UNCHS	DTCD, INSTRAW, UNESCO, UNCHS	DTCD, UNDP, World Bank, WHO, UNICEF, FAO, UNESCO, UNCHS	UNDP, UNICEF, World Bank, WFP
6. Water and environment (water quality management and pollution control)	ECE, ECLAC, ESCAP, UNEP, UNESCO, FAO, WHO, WMO, IAEA, UNIDO, UNCHS	DTCD, ECE, ECLAC, UNEP, FAO, WHO, UNESCO, UNCHS	DTCD, UNEP, ESCAP, ILO, FAO, WHO, UNIDO, IAEA, WMO, UNESCO, UNCHS	UNEP, UNDP, UNICEF
7. Flood control (flood loss management)	UNDRO, WMO, ECLAC, ESCAP, World Bank, UNESCO, UNCHS	WMO, ESCAP, ECE, UNESCO, UNCHS	UNDTCD, UNDRO, FAO, World Bank, UNCHS	World Bank, UNDP, WFP, CDF
8. Drought management (desertification control)	ECLAC, ESCAP, UNEP, WMO, UNDRO, FAO, UNESCO	DTCD, ECLAC, UNEP, UNDP, WMO, UNESCO	DTCD, UNDRO, UNEP, UNDP, FAO, WMO	World Bank, UNDP, UNEP, WFP
9. Technical cooperation among developing countries (TCDC)	ECA, ECLAC, ESCAP, FAO, UNEP	INSTRAW, ESCAP, ECLAC, UNEP	UNDP, World Bank, ESCAP, FAO, UNEP	UNDP, UNFP

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Table 2 (continued)

Major component of the Mar del Plata Action Plan	Data gathering, dissemination, reports to intergovernmental bodies, studies, publications	Meetings, conferences, symposia, seminars, workshops, expert groups	Technical cooperation activities	Resource transfers
10. Water for agriculture and fisheries (irrigation and drainage, rainfed agriculture, fresh water fisheries, aquaculture)	ECE, ESCAP, FAO, World Bank	ECE, FAO, UNDP, World Bank	FAO, UNDP, World Bank, ILO	UNDP, World Bank, WFP, IFAD, CDF
11. Community water supply and sanitation	UNCHS, ECA, ECE, ECLAC, ESCAP, ESCWA, INSTRAW, WHO, UNDP, World Bank	DTCD, CDF, ECE, ECLAC, WHO, UNCHS	DTCD, UNCHS, UNDP, UNICEF, ILO, FAO, WHO, World Bank	UNDP, UNICEF, UNFP, WFP, World Bank, CDF
12. Groundwater resources development (including exploration and well drilling)	DTCD, ECE, ESCAP, ESCWA, UNCHS, FAO, UNESCO	ECE, UNESCO	DTCD, UNDP, UNICEF, FAO, WHO, World Bank, UNCHS	UNDP, UNICEF, CDF, WFP, World Bank
13. Industrial water use	ECE, UNIDO	ECE	UNIDO, World Bank	UNDP, World Bank
14. Inland navigation	ECA, ECE	ECE	ESCAP, ILO	UNDP, World Bank

a/ Hydropower is included under energy resources (tables 5 and 6).

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Table 3. Objectives, priorities and budgetary allocations concerning mineral resources

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
CTC	Strengthen capability of host developing countries in dealing with matters relating to transnational corporations.	Advisory services related to specific arrangements on minerals with transnational corporations.		363.5	394.2 (1990 only)
DIESA	To formulate policies and strategies in the development and utilization of minerals in the context of changes in the global economy. To provide information and analysis on the reciprocal relationship between trends in the minerals sector and economic development.	Continous monitoring of changes in production, consumption, stocks, prices and associated activities and issues of mineral resources.		...	
OALOS	Service the Preparatory Commission for the International Sea-Bed Authority and for the International Tribunal for the Law of the Sea which deals with regulating exploration and exploitation of deep sea-bed minerals; monitor developments and provide information on ocean affairs and the law of the sea; provide advice and assistance in the formulation of national legislative frameworks and of integrated ocean management in accordance with the UN Convention on the Law of the Sea; assist and support regional cooperative efforts with these objectives.	Service the Preparatory Commission; provide advisory and informational assistance in formulating integrated ocean management to give effect to the UN Convention on the Law of the Sea.	RB	1 455.1	1 424.7
UNCTC	Development of mineral resources in the developing countries and assure access to financial resources by the developing countries. Promote rational use of mineral raw material.	Institution strengthening and training, investment promotion, management of the mineral resources.	RB XB	510.5 23 592.4	3 193.8 43 580.1
ECA	Assist member States and intergovernmental centres in the building up and/or improvement of technical knowledge of mineral resources; restructure mining industry, update and harmonize policies, legislation, marketing arrangements and taxation in respect of the mining sector; develop manpower as well as other appropriate structures within the framework of the principle of permanent sovereignty over mineral resources.	Monitoring and analysing mineral trends in African countries and advisory assistance in exploration, development and utilization.	RB XB	508.8 458.0	
ECLAC	Assist Governments in the formulation and implementation of policies for the development of mineral resources of the region through research studies, proposals for joint action programmes and promotion of cooperation among countries in industrial integration and market complementarity.	Cooperate in the organization of meetings concerning proposals on the implementation of regional training and technological research programmes and market complementaries.	RB	266.1	445.9
ESCAP	Assist the developing countries of the region in the assessment of their resource base of important minerals.	Strengthen national capabilities of investigations and development of mineral resources in support of economic and social development plans.	RB	522.0 583.0	673.0 523.0

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Table 3 (continued)

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
UNCTAD	Seek lasting solutions to deal effectively with the short-, medium- and long-term problems in the commodities area to achieve a better functioning of commodity markets and stable and more predictable conditions in commodity trade; enhance, strengthen or establish producer-consumer consultations and cooperation, to improve the operation and functioning of existing commodity agreements; negotiate new international commodity agreements or arrangements and make the Common Fund for commodities operational; intensify international cooperation between producers and consumers for the horizontal and vertical diversification of the economies of the developing countries, as well as increased participation in the processing, marketing and distribution, including transportation of their commodities.	Action with respect to individual commodities and support for the Common Fund for commodities; action with respect to developmental and general objectives of the International Commodity Policy.	PB a/ XB		276.0
UNEP	To achieve a better understanding of the evolution and functioning of the lithosphere, including the occurrence of mineral resources and deep groundwaters and the transmission of heat from the earth.	Establish guidelines on environmentally sound exploitation of mineral resources, guidelines on various mineral processing industries and on environmental impact assessment of sea-bed mining.	XB	100.0	100.0
UNCHS	Promotion and development of low-cost building materials industries in developing countries by exploiting, processing and utilizing locally available natural resources for the provision of affordable shelter especially for low income populations.	Strengthening national technological capacities in manufacturing affordable and durable building materials in order to accelerate the process of building construction in developing countries.	PB XB		167.5 1 583.9
UNDP	Assist developing countries in identifying and developing their mineral resources through the financing and execution of mineral exploration projects and feasibility studies.	Mobilize high risk capital to execute mineral exploration projects in developing countries.	PB	10 200.0	11 600.0
ILO	Assist Governments, employers' and workers' organizations to develop their capacity to deal effectively with the labour and social problems of the minerals sector and its occupational categories; develop technical cooperation focusing on safety and health and training in non-coal mines in developing countries; update and reorient existing training/education programmes for application in different mining sectors; carry out studies on labour and social issues affecting small-scale mines, particularly in the informal sector; undertake study on the effects of fluctuating commodity prices on labour and social issues in countries heavily dependent on a single mineral commodity.	Holding of Fifth Tripartite Technical Meeting for Mines other than Coal Mines and follow-up action; development and execution of technical cooperation in mining, particularly in the area of mine safety.	PB XB		1 100.0 (approx.) 3 300.0 (approx.)

Table 3 (continued)

Organization	Objectives	Priorities	Budgetary resources (Thousands of dollars)	1988-89	1990-91
IAEA	Collect, evaluate and maintain data on world nuclear fuel resources, supply and demand. Exchange information on uranium and thorium geology, exploration, ore processing and mining. Provide assistance to member States in nuclear raw material resource assessment and development.	Provide a comprehensive picture of nuclear fuel resources as a basis for long-term planning of the development of nuclear power and fuel cycle strategies. Prepare guidebooks and manuals on various topics in uranium exploration, development and production to serve primarily the developing member States. Promote wider use of exploration data and technology developed primarily for radioactive mineral exploration for the evaluation of other mineral resources and environmental studies (natural background radiation). Maintain data base system on world's uranium deposits.	RB XB	1 775.0 3 500.0	1 490.0 2 500.0
UNESCO	Assist member States in evaluating their mineral potential; train geologists from developing countries in topics related to minerals through post graduate training courses and on-the-job education.	Increase in the scientific knowledge of geological processes leading to the formation of and the distribution of ore deposits and of renewable energies such as geothermics. Improve the capability of member States through transfer of technology post-graduate training. Improve the dissemination of geological results through publications (books, maps, etc.).	RB XB	3 051.0 671.0	
UNIDO	Studies on trends in demand, consumption and production development of major non-ferrous metals industries as a basis for programming technical assistance. Production and use of non-metallic minerals in developing countries. Overview trends and developments in advanced ceramics as applicable to the developing countries.	Develop strategies for technical assistance in mineral resources development, production and utilization, especially in non-ferrous metals, non-metallic minerals and advanced ceramics.	RB	10	
UNRFNRE	Exploration for solid minerals.	Continue works on 5 operational minerals projects. Identification and start-up of two additional minerals projects each year.	RB XB	...	
UNDP	Provide assistance through technical cooperation for meeting the development objectives of developing countries through exploration and development of indigenous mineral resources.	Ensure priorities as established by recipient countries; meet programme objectives and procedures.	RB	27 690 b/	
WORLD BANK	Promote exploration and development of mineral resources.	Provide financial resources for exploration and development of mineral resources.		8 504 (for 1988 only)	

a/ Structure of the budget does not allow direct identification of expenditure in that area.

b/ Indicative planning figures for mineral resources subsector executed by all agencies in the United Nations system, including the Office of Project Services of UNDP.

/...

Table 4. Involvement of the United Nations system in mineral resources

Priorities	Data gathering, dissemination, reports to intergovernmental bodies, governmental bodies	Meetings, conferences, symposia, seminars, workshops, expert groups	Technical cooperation activities	Resource transfers
1. Data collection, analysis and dissemination	DIESA, DTCD, OALOS, ECA, ECLAC, ESCAP, UNCTAD, IAEA, ILO, UNESCO, UNIDO, UNCHS	DTCD, OALOS, ESCAP, UNESCO, UNCTAD	DTCD, ESCAP, UNCTAD	
2. Mineral planning, policy analysis and projections	DIESA, DTCD, ECA, ESCAP, UNCTAD, IAEA, UNCHS	DTCD, ECA, ESCAP, ILO, UNCTAD, IAEA, UNCHS	DTCD, ECA, UNDP, UNCTAD, UNCHS	
3. Mineral exploration and exploitation	DTCD, OALOS, ECLAC, ESCAP, UNESCO, UNIDO, IAEA	DTCD, OALOS, ECLAC, ESCAP, ILO, IAEA	DTCD, ECA, ECLAC, IAEA, UNESCO, UNRFNRE, World Bank	UNRFNRE, World Bank
4. Development and transfer of mineral technologies	DTCD, IAEA, UNCHS	DTCD, UNCHS	DTCD, IAEA, UNDP, UNCHS	
5. Mining efficiency	ESCAP	DTCD, ILO, IAEA	DTCD	
6. Local processing of minerals	DTCD, ESCAP, UNCTAD, UNCHS	UNCTAD, UNCHS	DTCD, UNCTAD, UNCHS	
7. Mining legislation, regulations and agreements	DTCD, OALOS, UNCTAD, IAEA	ILO, OALOS, UNCTAD, IAEA	DTCD, CTC	
8. Environmental and social impacts of mineral development and utilization	DTCD, OALOS, ESCAP, UNEP, UNIDO, ILO, UNCTAD, IAEA, UNCHS	OALOS, ILO, UNCTAD, IAEA, UNEP, UNCHS	ILO, UNCTAD, IAEA, UNEP, UNCHS	
9. Strengthening of mineral institutions	DTCD, UNCHS	UNCHS	DTCD, IAEA, UNCHS	
10. Intercountry cooperation in minerals	ECLAC, UNCTAD, UNCHS	DTCD, UNCTAD, UNCHS	DTCD, ECA, ECLAC, ESCAP, UNCTAD	

Table 5. Objectives, priorities and budgetary allocations concerning energy resources

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
DIEC	Systemwide coordination on new and renewable sources of energy issues by drawing fully on the organs of the United Nations system and fully utilizing the facilities available within the machinery of ACC; IDEC chairs the ACC Inter-Agency Group on NRSE; direction and coordination of activities relating to the General Trust Fund established to facilitate activities related to new and renewable sources of energy activities; promotion of the development and utilization of renewable energy sources in developing countries.	Systemwide cooperation and coordination and global approach to new and renewable sources of energy issues. Short-term impacts (economic, social and environmental) and long-term perspectives of new and renewable sources of energy questions: establishment of an international network of centres of excellence on NRSE and preparation of a contribution to 1992 UNCED.	RR XB		350.0 734.0
DIESA	Survey and monitor the world energy situation and prospects in their international context, analyse emerging international energy issues and problems including energy exploration and development in developing countries, and identifying areas for expanding cooperation; monitor, collect, analyse and disseminate information on developments with particular reference to multilateral, bilateral, national and other programmes in the field of new and renewable sources of energy.	Survey the world energy situation and prospects, analysis of emerging international energy issues and problems and review institutional evolution in the energy sector.	RR XB	867.9 38.0	832.0 40.0
		Provide information on multilateral, bilateral and other programmes in the area of new and renewable sources of energy.	RR XB	682.0	610.0 159.3
CTC	Strengthen capability of host developing countries in dealing with matters relating to transnational corporations.	Advisory services related to specific arrangements on energy with transnational corporations.		641.3	276.8 (1990 only)
DTCD	Provide technical assistance focusing on the exploration for fossil fuels, hydropower and geothermal energy; improve the efficiency of energy use and promote energy conservation measures within the context of national energy policy; promote better information management for energy policy decision-making, energy planning and monitoring and control of the activities related to the development of energy resources; support government efforts to acquire or develop technologies for energy exploration and a more efficient use of energy resources including biomass fuels, solar, wind and small hydropower resources to meet or supplement energy demand in rural areas and isolated energy consumption centres; introduce appropriate technologies to reduce the environmental impacts of energy sector productive activities.	Assist Governments in establishing national energy policies and alternative strategies for the development of energy resources, as well as the use of energy; strengthening and building national institutions for energy planning and energy resources development, including assistance in drafting legislation and training personnel; developing adequate information systems for energy planning and resource development; establishing pilot projects to demonstrate the feasibility of new and renewable energy technologies; development and implementation of strategies, policies and programmes to analyse and minimize environmental consequences due to energy production, transformation and utilization.	RR XB	2 221.0 27 010.0	4 772.6 41 600.0
CSTD	Examination of the relationship between energy, environment and development, including patterns of energy production and consumption; assessment of energy technologies from the point of view of their potential to meet future energy demand while preventing environmental pollution.	Identification of environmentally sound energy strategies, policies and measures.	RR XB		33.0 450.0
ECA	Increase the availability of energy resources in Africa so as to ensure indigenous and self-sustained development; and to diversify energy sources and provide better living conditions in rural and remote areas by making better use of all sources of energy, with emphasis on new and renewable sources.	Exploration, evaluation and development of energy resources in Africa.	RR XB	410.7 220.0	

Table 5 (continued)

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
ECE	Foster short- and long-term sustainable demand/supply developments and patterns, particularly by enhancing energy economy and efficiency; promoting East-West energy trade and cooperation.	Collect and analyse energy data and the preparation of analyses of technical, economic, and environmental aspects of coal, gas, electric power and new and renewable sources of energy and on conservation and efficiency; identification of topics for cooperation; preparation of energy projections.		...	
ECLAC	Support Governments in the region in their efforts to formulate national energy-sector objectives and policies.	Develop a computerized statistical and bibliographic energy information system and analysing problems in energy planning.	RB	441.2	549.3
ESCAP	Provide assistance to developing member countries in managing their energy resources on a systematic and comprehensive basis.	Strengthen national capabilities in integrated energy planning and programming and management of energy demand; policy options and strategies; assessment of energy for rural applications and integrated planning; energy conservation and conversion policy; power system planning and management.	RB XB	864.1 3 885.1	903.5 2 966.9
ESCWA	Development of conventional and non-conventional energy resources in the member countries and formulation of appropriate policy measures for energy planning and conservation. Identification of projects aimed at promoting subregional, regional as well as interregional cooperation for more efficient use of energy.	Assessment of the impact of changes in the oil market on energy policies and development prospects in the region. Monitoring of energy-related activities and developments in the region. Methodology for integrated energy planning in the region. Energy conservation and efficiency; energy audits for selected energy-intensive industries in the region.	RB XB	1 039.4 52.3	
INSTRAW	Incorporate women's needs and participation into mainstream policy design, planning and implementation of programmes based on new and renewable sources of energy which offer cost-effective and sustainable complements to traditional systems; expand the scope of training packages on "Women, New and Renewable Sources of Energy" for use at the national and the community levels field programmes.	Promote women's role in the planning of new and renewable sources of energy in accordance with the mandate given by ACC Inter-Agency group on NPSF, 1990 and Nairobi Plan of Action; continue to conduct national training seminars on "Women, New and Renewable Sources of Energy"; promote the dissemination of the training packages.	RB XB	...	5.0 487.0
UNCHS	Identify the potential of new and renewable energy sources in relation to, and with a view to their application in, human settlements in developing countries.	Integration of energy management with the overall programme of human settlements development by promoting the development of standards and technologies for the provision of economically efficient shelter and infrastructure.	RB XB	31.0 36.0	222.6 1 061.1
UNCTAD	Promote the transfer, application and development of energy technologies, including new and renewable sources of energy in developing countries.	Develop appropriate policies in developing countries for the transfer, application and development of energy technologies in developing countries.	RB XB	8 m/m 3.4	
UNDP	Provide assistance through technical cooperation for meeting the energy needs of developing countries through exploration and development of indigenous energy resources, conservation and efficiency.	Ensure priorities as established by recipient countries meet programme objectives and procedures.	RB	67 862.5	

Table 5 (continued)

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
CDF	To design, finance and monitor energy projects, particularly in the fields of hydropower and biogas, to meet the basic needs of lower income groups in the LDCs. Infrastructure building and provision of equipment.	New and renewable energy. Cost-effectiveness.	RB	282.0 a/	
UNEP	Promote the incorporation of environmental considerations into energy policy and planning both at technical and institutional levels in national Governments and other United Nations and international organizations.	Support energy-environment policy studies in major developing countries; develop tools and guidelines to assist in the incorporation of environmental considerations into energy policy and planning, promotion of energy efficiency and conservation.	RB XB	700.0	 800.0
UNITAR	Demonstrate the importance of small energy resources and unconventional fuels such as heavy oil and tar sands for economic development. Conduct promotional workshops and seminars in relation to new and renewable sources of energy, in particular tar sands and solar energy.	Promotion of small energy resources, heavy crude and tar sands.	XB/RB	1 080.5	791.9
UNRFNRE	Promote exploration and development of geothermal resources.	Develop geothermal energy in developing countries.	RB XB	... ...	
UNU	To develop, demonstrate and disseminate methods and techniques that can result in new policy options in the field of new and renewable energy sources, alternatives to coal and fuelwood, energy conservation and efficiency.	Prefeasibility survey for the establishment of a network of centres of excellence of international scope on new and renewable sources of energy. Publication of ASSET-Journal. Training in alternative and renewable energy systems.	RB	420.0 (Specific programme contribution, Italian Government)	199 162
FAO	Assists member countries in formulation and implementation of energy strategies plans and programmes for sustainable rural development, in particular, the consolidation and closer integration of energy and rural development plans; promote the development, diffusion and application of rural energy technologies based on both conventional and renewable energy sources, with an emphasis on utilization of the biomass (wood, agricultural residues, biogas, etc.) solar, wind, water, and geothermal energies for power, household and small-medium agro-processing and mechanization; improved fuelwood supply, promote its more efficient use and wood-based energy conversion systems; promote the exchange of information and experiences of rural energy technologies, planning and programmes.	Energy assessment and planning for sustainable rural and agricultural development energy technology development and application; development and dissemination of information; improvement of wood energy conversion systems, charcoal production methods and wood for rural energy generation.	RB	1 506.0	1 238.0
IAEA	Assist member States in strengthening their capability to develop an integrated approach to the planning of nuclear power programmes within a rational and coherent energy and general development policy; study of nuclear fuel cycle technology problems which need to be solved in order to ensure the steady development of nuclear power as a whole; dissemination of technical and environmental information, preparation of regulatory material and provision of assistance to member States in radioactive waste management.	Collect, evaluate and maintain data on world nuclear fuel resources, supply and demand; exchange information on uranium and thorium geology, exploration, ore processing and mining; provide assistance to member States in nuclear raw material resource assessment and development.	RB XB	1 836.5 3 500.0	1 490.0 2 500.0

.../...

Table 5 (continued)

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
ILO	Develop integrated, energy-related projects which promote employment, generate income, develop vocational and management skills, and improve conditions of work and life.	Provide manpower assessment to facilitate the energy transition in the developed and developing countries; identify fuel requirements in rural areas and enhancing the ability of the rural poor to meet their basic needs; examine labour and social conditions in energy sectors, e.g. petroleum, coal, electricity, household fuels.	RB XB	618.0	375.0 750.0
UNESCO	Promote development of autonomous solar electricity supply for low consumption use in rural and remote areas. Better understanding of the role of renewable sources of energy and of the socio-economic and cultural consequences of their utilization and training of local personnel to enable them to organize local production of low cost and low maintenance solar apparatus. Strengthen international and regional, especially European, cooperation in the renewable energy field and global energy phenomena. Assist member States in evaluation of their energy potential. Train geologists from developing countries in topics related to energy through post-graduate training courses and on-the-job education.	Develop the use of renewable sources of energy, particularly in rural areas. Organize training courses for specialists in developing countries in the field of autonomous solar electricity supply to rural and remote areas and preparation of high-level training courses on disciplines basic for power engineering education. Coordinate activities in the field of global energy problems and promote cooperation in the field of solar energy. Increase scientific knowledge of geological processes leading to the formation of and the distribution of renewable energies such as geothermics. Improve the capability of member States through transfer of technology post-graduate training. Improve the dissemination of geological results through publications (books, maps, etc.).	RB* XB	5 185.0 671.0	
WHO	Assessment of health risks of the production, distribution and use of different forms of energy and assistance in incorporating health considerations in the planning and development of energy systems and facilities.	The health aspects of the burning of biomass fuels; health risk assessment of fossil fuels and nuclear power. The WHO Commission on Health and Environment has established a Panel on Energy - a report of the Commission will be issued in the last half of 1991.	RB XB	50.0	50.0 50.0
WORLD BANK	Promote exploration and development of indigenous energy resources, conservation and efficiency.	Development of indigenous energy resources such as natural gas and hydropower and improvement of energy supplies to rural areas.	RB	430 453	
UNIDO	Supply of energy-related industrial and technological information through information packages, technical publications and technical cooperation. Creation of institutional linkages with computerized exchange of information on industrial energy conservation. Support for research on the industrial aspects and applications for solar energy. Identification and evaluation of the alternative energy source of biomass as a basis for rural industrialization.	Collection and dissemination of information on energy-related technologies. Promotion of information networks in energy conservation. Cooperative research programmes related to commercialization of solar energy research. The integrated use of biomass.	RB	37 m/m	448.3
WFP	Assist in increasing national supplies of energy from renewable sources.	Support projects in relation to planting and managing of trees for use as wood energy.	RB	492 595.0	462 828.0

Table 5 (continued)

Organization	Objectives	Priorities		Budgetary resources (Thousands of dollars) 1988-89	1990-91
WMO	Help National Meteorological Services (NMS) in applying energy-meteorology.	Expert support missions to NMS. Preparation of guidance material on energy-meteorology application. Review of need for future support in the area of energy-meteorology, including review of user requirements.	RP	44.0	

* Includes minerals.

a/ CDF figures represent the value of projects and grant increases approved for these periods on the basis of declared government priorities.

Table 6. Involvement of the United Nations system in energy resources

Priorities	Data gathering, dissemination, reports to intergovernmental bodies, studies, publications	Meetings, conferences, symposia, seminars, workshops, expert groups	Technical cooperation activities	Resource transfers
1. Data collection, analysis and dissemination	DIEC, DIESA, UNEP, UNITAR, UNU, INSTRAW, ECA, ECE, ECLAC, ESCAP, ESCWA, UNCHS, ILO, UNESCO, UNIDO, WMO, IAEA, FAO, UNCTAD, UNCHS	DIEC, DIESA, UNITAR	DTCD, ESCAP, ESCWA, UNCHS, ILO	
2. Energy planning, policy analysis and projections	DIEC, DIESA, DTCD, UNEP, UNU, ECE, ECLAC, ESCAP, ESCWA, IAEA, FAO, UNCHS	DTCD, CSTD, UNU, ECE, ESCAP, FAO, UNCHS	DTCD, UNDP, UNEP, ECA, ESCAP, UNIDO, IAEA, UNEP	World Bank
3. Exploration, assessment and development of energy resources	DIEC, DIESA, DTCD, ECA, ECE, ECLAC, ESCAP, ESCWA, FAO, UNESCO, IAEA	DIEC, DTCD, CSTD, ECA, ECE, ESCAP, IAEA	DTCD, UNDP, UNRFNRE, ECA, ESCAP, FAO, UNESCO, UNIDO, IAEA	World Bank
4. Development and transfer of energy technologies	DIEC, DIESA, DTCD, UNCTAD, UNU, ECLAC, ESCAP, ESCWA, UNCHS, FAO, UNESCO, UNIDO, IAEA	DIEC, DIESA, DTCD, UNU, ESCWA, FAO, UNCHS	DTCD, UNCTAD, UNDP, ECA, ESCAP, FAO, UNESCO, UNIDO, IAEA	World Bank
5. Environmental and social impacts of energy development and utilization	DIEC, DIESA, DTCD, UNEP, ECE, ESCAP, INSTRAW, ILO, WMO, IAEA, FAO, UNCTAD	DIEC, DTCD, IAEA	DTCD, UNEP, UNIDO	World Bank
6. Energy conservation and efficiency	DIESA, DTCD, ECE, ESCWA, UNCHS, FAO, UNEP	DTCD, UNU, ESCAP, UNCHS	DTCD, UNDP, ESCAP, ESCWA, UNIDO, FAO	DIEC, World Bank
7. Rural energy and electrification	DIESA, UNU, ECLAC, ESCAP, FAO, UNIDO, UNCHS	DIESA, DTCD, UNU, ESCAP, UNIDO, FAO	DTCD, UNDP, UNEP, ESCAP, ESCWA, FAO, UNIDO	UNCDF, WFP, World Bank
8. Strengthening of energy institutions	DIEC	DIEC	DTCD, UNDP, UNIDO, FAO	World Bank
9. Energy laws, regulations and agreements	DIESA, ECE, ILO	DIESA, DTCD, CTC, ILO	DTCD, CTC	World Bank
10. Intercountry cooperation in energy	DIESA, DTCD, UNU, ECA, ECE, ESCAP, ESCWA, UNIDO, FAO	DTCD, UNU, ECE, FAO	DTCD, UNDP, UNIDO, FAO	

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DISASTER PREVENTION AND MITIGATION IN DEVELOPING AND UTILIZING NATURAL RESOURCES

Activities of the United Nations system concerning disaster prevention and mitigation in developing and utilizing natural resources

Report of the Secretary-General

SUMMARY

The present report has been prepared in response to decision 11/1 of the Committee on Natural Resources, in which the Committee requested the Secretary-General to prepare, for its consideration at the twelfth session, a comprehensive report on the activities of the United Nations system in the area of disaster prevention and mitigation in developing and utilizing natural resources. The report contains the information provided by organizations and agencies of the United Nations system on their activities in that area.

* E/C.7/1991/1.

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INTRODUCTION

1. The Committee on Natural Resources, in its decision 11/1 of 5 April 1989, decided to include in the agenda of its twelfth session an item entitled "Disaster prevention and mitigation in developing and utilizing natural resources", on the understanding that the Committee would treat the item in a focused manner and in full accord with the theme assigned to it by the Economic and Social Council. The Committee requested the Secretary-General to prepare, for submission to the Committee at its twelfth session, a comprehensive report on the activities undertaken by the United Nations system in connection with disaster prevention and mitigation in developing and utilizing natural resources.

2. The present report has been prepared in response to the above decision and contains the information received from organs, organizations, agencies and funds of the United Nations system concerning their activities related to disaster prevention and mitigation in developing and utilizing natural resources. The annex to the report contains a synoptic table of the potential of organizations and agencies to contribute to disaster prevention and mitigation.

INFORMATION RECEIVED FROM ORGANS, ORGANIZATIONS AND BODIES OF THE UNITED NATIONS SYSTEM

A. United Nations

1. Economic and Social Commission for Asia and the Pacific

3. The Economic Commission for Asia and the Pacific (ESCAP) continues to be involved in promoting and enhancing cooperative efforts in the Asia and Pacific region to mitigate the damage from typhoons, cyclones, floods and droughts. Continuous support has been provided to the ESCAP/World Meteorological Organization (WMO) Typhoon Committee and the ESCAP/WMO Panel on Tropical Cyclones, two intergovernmental bodies.

4. The medium-term plan for the period 1984-1989, under programme 7 (Natural Resources in Asia and the Pacific), included a programme element on the mitigation of damage from cyclones, floods and drought, which has been continued in the current medium-term plan.

5. With a view to the rational development and utilization of land and water resources and the reduction of flooding, a manual and guidelines for flood risk analysis and mapping were prepared and finalized at an expert group meeting in 1988. The manual and guidelines have been published and widely distributed.

6. ESCAP has recently prepared a study on problems caused by natural disasters in selected least developed and developing island countries of the region. In addition, a report on long-term effective measures to mitigate the effects of disasters was published as part of the Water Resources Series. Work on phase I of the urban flood loss prevention project was completed by fielding missions to eight

major cities in the region and holding a workshop. The proceedings of the project were published as part of the Water Resources Series.

7. A manual and guidelines for comprehensive flood loss prevention, also related to developing and utilizing natural resources, has been finalized and will be issued shortly. Advisory missions and seminars are being organized in concerned member countries in order to disseminate the techniques outlined in the manual and guidelines.

8. The programme of work related to water resources for the biennium 1990-1991 has been designed to take into account the requirements of the International Decade on Natural Disaster Reduction. A project entitled "Promotion of measures for reduction of water-related disasters in Asia and the Pacific through research, training and advisory services - phase I" was included in the programme of work. A separate activity, the ESCAP/Office of the United Nations Disaster Relief Coordinator (UNDRO) Regional Symposium on the International Decade on Natural Disaster Reduction, was held at Bangkok from 11 to 15 February 1991. Participants from 25 member and associate member countries of ESCAP were invited to the Symposium, which considered the question of disasters as a result of cyclones, floods, droughts, earthquakes, tsunamis and volcanic eruptions. Another project, on the assessment of current preparedness programmes, forecasting systems and operational methods for water-related natural disaster reduction in the ESCAP region, is scheduled to be held at Bangkok from 29 April to 3 May 1991. Advisory missions will be sent to countries wishing to introduce or enhance preparedness programmes, on the basis of the recommendations of the workshop.

9. A report on preparedness, including available mechanisms and facilities, and measures for water-related natural disasters, consequences, mitigation and prevention in the interested countries of the region is expected to be submitted to the ESCAP Committee on Natural Resources for its consideration at its sixteenth session, at Bangkok in September 1991.

10. Future activities in water-related natural disaster reduction include a proposal for a workshop to develop guidelines for the application of cyclonic storm hydrology in natural disaster reduction in the region.

11. In the draft programme of work of the Water Resources Section for the biennium 1992-1993, the subject of natural disaster reduction was assigned the highest priority. Starting in 1992, two new projects will be introduced. The first one involves integrated river system development and management, with reference to comprehensive flood loss prevention and management. The second relates to storm surge risk mapping and analysis.

12. The future activities of ESCAP include providing assistance to member States in the following areas:

(a) Preparation of flood risk maps;

(b) Preparation of storm surge maps;

(c) Implementation of various aspects of comprehensive flood loss prevention and management;

(d) Establishment of guidelines for the application of cyclonic storm hydrology;

(e) Establishment or upgrading of national disaster prevention and preparedness plans;

(f) Improvement of damage assessment and reporting;

(g) Study of effects of deforestation, urbanization and changing land use on the hydrology of the catchment and on the intensity of floods;

(h) Drought hazard assessment;

(i) Tsunami maps etc.

13. Since 1985, the Mineral Resources Section of ESCAP has been involved in various disaster reduction activities through the programme entitled "geology for urban development". Studies were carried out in a number of cities affected by seismic risk, subsidence, groundwater contamination, highly compressive soils and karst collapse. The following meetings were organized within the urban geology programme: (a) Expert Working Group Meeting cum Workshop on the Urban Geology of Coastal Areas (Shanghai, October 1987); (b) Seminar on Geological Mapping in the Urban Environment (Bangkok, October 1986); and (c) Meeting on Quaternary Geosciences and Human Survival (Bangkok, November 1988), in cooperation with the United Nations Educational, Scientific and Cultural Organization (UNESCO).

14. ESCAP activities during the period 1987-1990 have included a systematic survey of the urban geology of more than 77 areas in 20 countries. These studies have been published in the Atlas of Urban Geology series, the most recent volume of which was issued in late 1990 and covered geology for land-use planning in Asia. The studies noted that large cities in Asia have spread into areas in which geological conditions are unsuitable for various land uses. As a result of the ESCAP programme, planners and geologists have worked together to develop a series of thematic maps that would be useful for land-use planning. The maps show areas affected by both man-made and natural hazards.

15. Other activities include the provision of in-house training in urban geology and the mapping of large cities in a number of countries. More recently, these studies focused on the mitigation of seismic risk in Indonesia, subsidence in Hanoi, Viet Nam, and assessment of the damage resulting from the 16 July 1990 earthquake in the Philippines. A series of meetings have also reviewed the impact of man on Quaternary environments and were especially concerned with the mapping and correlation of Quaternary stratigraphy in the region. These latter activities were organized jointly by ESCAP and UNESCO as part of International Geological Correlation Programme Project 296, Quaternary of the Asia/Pacific region. ESCAP arranged a Seminar on Geology and Land-Use Planning, at Kuching, Malaysia, and two workshops on Quaternary geology of the Asia/Pacific region, in Malaysia and

Thailand in 1989 and 1990 respectively. A course on assessment and evaluation of construction materials for urban development was organized at Kuala Lumpur in 1990.

16. ESCAP continues to provide assistance to member States in the mitigation of earthquakes, volcanic eruptions, landslides and various other types of natural disasters.

17. The ESCAP/United Nations Development Programme (UNDP) Regional Remote-Sensing Programme, which deals with the promotion of operational uses of remote sensing and geographical information systems in natural disaster reduction, for better development and utilization of land and water resources, organized a workshop on the application of remote sensing to flood plain mapping and monitoring at Dhaka in December 1989.

18. A pilot project on flood mapping and monitoring using remote-sensing and GIS technologies has been completed jointly by Bangladeshi and Chinese experts through arrangements for technical cooperation among developing countries, under the coordination of the ESCAP/UNDP Regional Remote-Sensing Programme. A methodology for flood plain mapping and monitoring using integrated remote-sensing and GIS technologies has been developed and will be tested in Bangladesh in 1991.

19. In cooperation with the Outer Space Affairs Division and the Government of China, the Regional Remote-Sensing Programme is organizing an interregional seminar on remote-sensing applications to disaster monitoring, to be held in September 1991. The seminar will emphasize operational methodology for disaster monitoring and forecast through remote-sensing and GIS technologies.

20. In its next phase, from 1992 to 1996, the Regional Remote-Sensing Programme will place special emphasis on promoting the capabilities of member countries in using GIS technology, as well as microwave technology, such as synthetic aperture side-looking radar and high-resolution satellite data for disaster monitoring and assessment. Priority will be given to the least developed countries to transfer low-cost, PC-based image processing and GIS technologies for operational uses in disaster management.

21. The Environment Section of ESCAP organized a Conference at the Ministerial Level on Environment and Development in Asia and the Pacific, which was held at Bangkok from 10 to 16 October 1990. The agenda of the Conference included regional cooperation in disaster warning measures and in the field of coastal area resources development and management, which identified the directions of technology transfer and recommended the establishment of an international centre on early detection and warning of approaching cyclones. The Ministerial Declaration welcomed the establishment of research, training, policy and other institutes and centres dealing with environmental and development activities with a view to promoting exchange of information, technical assistance and regional cooperation. ESCAP should play an important role in fulfilling that task.

22. The Human Settlement Unit of ESCAP undertook research on disaster mitigation policy measures and, in 1987, published a study on human settlement planning in disaster-prone areas, focusing on the management of marginal settlements. The

study reviewed the current policies and practices of member countries for disaster mitigation, in particular through land-use planning, building design and codes and training programmes.

23. In the future, the Unit will organize seminars and workshops to exchange experiences and knowledge on disaster mitigation measures.

24. Since 1984, the Agriculture and Rural Development Division of ESCAP has been carrying out the Agro-climatic Assessment Programme in eight developing countries members of ESCAP. The project was designed to develop national capabilities to predict crop failures and food shortages caused by the impact of drought. Later, in 1989, remote-sensing technology was incorporated into the crop assessment systems. This new phase of the programme, known as the Satellite Crop Monitoring (SCM) Project, has been implemented in Indonesia, Malaysia, the Philippines and Thailand, initially on a pilot basis.

25. A Regional Evaluation Seminar on Satellite Crop Monitoring was held at Bangkok in November 1990 to assess the usefulness and efficacy of the SCM Project. The Seminar recommended that the SCM Project be continued in the future and that the upcoming phase, if funding could be obtained (estimated at $US 1.45 million), would include Bangladesh, China, Nepal, Sri Lanka and Viet Nam, which have expressed interest in joining the Project.

2. Economic Commission for Latin America and the Caribbean

26. Between 1988 and 1990, the Economic Commission for Latin America and the Caribbean (ECLAC), in close cooperation with WMO and using extrabudgetary support provided by the Government of Italy, executed a technical cooperation project entitled "Prevention of natural disasters in Latin America and the Caribbean". Its main purpose was to define existing capabilities and needs concerning the establishment of flood forecasting systems in the region. After a detailed survey was completed, a proposal was formulated to undertake the design and implementation of flood forecasting systems in 15 selected river basins located in an equal number of countries in the region. The Governments discussed and agreed upon the proposal, which will be submitted shortly to the Government of Italy for financing.

27. ECLAC has continued to assist its member Governments in assessing the social and economic impact of major natural disasters. Furthermore, and as part of the rehabilitation and reconstruction efforts following such disasters, ECLAC has assisted in the formulation of projects or schemes for disaster prevention and mitigation. It is completing the publication of a Manual for the Assessment of the Socio-economic Effects of Natural Disasters, which contains the methodology developed by ECLAC for assessing the damage caused by disasters of either meteorological or geological origin.

3. United Nations Development Programme

28. UNDP resident representatives are ex officio representatives of UNDRO and their role is of considerable importance in representing that organization to the host Government, especially in issues concerning disaster mitigation.

29. As at December 1990, UNDP funds devoted to ongoing rehabilitation projects totalled $12.6 million. Other projects principally devoted to post-disaster reconstruction and rehabilitation had important disaster preparedness and mitigation components.

30. During 1990, with a view to improving its institutional capacity in this area, UNDP initiated the following activities:

(a) Disasters and development. UNDP has commissioned a study on institution-building as related to this subject. The objective of the study is to produce a set of lessons learned on the way in which Governments are addressing the effects of slow-onset or recurrent natural disasters, and to derive from those lessons recommendations on how UNDP can best cooperate with Governments through the programming process to mitigate the effects of disasters. The study, which is being carried out in three stages, including extensive field studies in three countries, is expected to be completed in January 1991.

(b) UNDP/UNDRO Disaster Management Training Programme. Parallel to the above study, UNDP and UNDRO have launched a cooperative effort for training the staff of the two organizations in disaster reduction matters, with particular emphasis on the links between disaster reduction and the ongoing development process. This training scheme has brought together a consortium of university-based disaster management institutions at the global level, regional institutions in each of the four developing regions, and country-level institutions and personnel involved in disaster management. The emphasis will be on training country personnel (comprising United Nations system personnel, non-governmental organizations, bilateral donor representatives and government representatives, including those from government central planning organizations) in the techniques of integrating disaster mitigation activities into ongoing development programmes, as well as assisting them to function as a country team in a disaster situation. It is planned that approximately 4,000 persons will receive training of varying duration and content over the next three to four years. The training will focus on the needs of personnel in 50 disaster-prone developing countries.

4. Office of the United Nations Disaster Relief Coordinator

31. The role of UNDRO in disaster mitigation is to assist Governments and advise them of the entire spectrum of policies and measures that can be taken in advance of a disaster to reduce its impact. These include identification of prevailing hazards, estimation of risk (probable losses from given disaster scenarios), formulation and implementation of mitigation programmes, creation of institutional structures responsible for disaster mitigation and management, and training of those responsible for the technical and organizational aspects of obtaining and disseminating knowledge on those subjects.

32. Some of these activities address the risks related to developing and utilizing natural resources, including water supply, petroleum exploitation, nuclear power plants, hydropower, and the transport of dangerous chemicals. For example, UNDRO has given advice on volcanic risks to an oleoduct in Colombia in 1985, on earthquake and landslide risks to a vital petroleum pipeline in northern Ecuador in 1987, and on marine oil spill emergency planning in the Caribbean. It has participated in an evaluation of the consequences of the Chernobyl nuclear disaster and the lessons learned for the protection of communities from future occurrences of this kind. In Argentina, in 1988, it helped to establish a procedure for investigating and mitigating risks to the population downstream of a major water reservoir. In Egypt, in 1989 and 1990, it assisted in evaluating risks related to dam failure as well as those arising from the contamination of groundwater resources. In Colombia, in 1990, as part of a broad-spectrum project in disaster mitigation, UNDRO helped to organize a seminar on preparedness for industrial hazards and those relating to the transport of dangerous materials.

33. In promoting such activities, the role of UNDRO is to a large extent promotional and advisory, taking into account the expertise and facilities available within other parts of the United Nations system and in the academic and research fields. The primary function of UNDRO is to ensure that national disaster management authorities are fully aware of risks and of the most appropriate mitigative measures.

5. United Nations Centre for Human Settlements (Habitat)

34. The United Nations Centre for Human Settlements (Habitat) (UNCHS), through its operational activities, is assisting Governments in various aspects of pre-disaster planning and preparedness and mitigation of natural disasters as they affect human settlements. The Centre also carries out research, training and information activities concerning such issues as settlement planning in disaster-prone areas, seismic surveys, vulnerability analysis, microzoning, remote sensing, modelling, and land-use planning.

35. The operational activities of the Centre include the implementation of projects in Algeria, Bangladesh, Bolivia, Dominica, Ecuador, El Salvador, Kenya, Mexico, Nepal, Peru, the Turks and Caicos Islands, Viet Nam, Yemen and Yugoslavia. These projects deal with a wide range of issues, including the following: reconstruction of housing and settlements, hurricane-resistant housing, seismic mitigation, earthquake-resistant structures, including low-cost housing, and the use of appropriate technologies to prevent or mitigate the impact of disasters.

36. The Centre is also addressing the issue of natural resources use and technologies in the context of its research programme, which includes such activities as the Symposium on Mitigation of the Effects of Seismic Activities on Human Settlements, held at Tbilisi, Georgian Soviet Socialist Republic, in 1989; the presentation of a research paper to the World Bank Colloquium on the Environment and Natural Disaster Management in 1990; and the UNCHS/World Bank project on disaster prevention and mitigation in metropolitan areas, 1991-1992.

6. United Nations University

37. The United Nations University (UNU) in collaboration with the Department of Mineralogy of the University of Geneva, is planning an annual course on the study of risk geology, to take place from 22 April to 5 June 1991, at the University of Geneva.

38. The objectives of the course are to develop expertise that would permit saving lives and reduce economic damages resulting from natural hazards. This expertise will be utilized to create or strengthen institutions involved in monitoring and research of natural hazards in countries where these are prevalent.

39. The course, leading to a certificate of specialization, consists of two parts: (a) lectures on selected subjects (six weeks) and (b) individual thesis (four weeks). The curriculum incorporates theoretical courses with practical laboratory and field work. A one-week multi-disciplinary field study is included in a volcanic risk zone. A thesis based on individual research is expected to demonstrate the aptitude of the candidate to tackle a problem scientifically.

40. The contribution of UNU to the course consists of providing lectures and financial aid to participants from developing countries.

41. The United Nations University is carrying out the Mountain Ecology and Sustainable Development Research and Training Programme, which is concerned with the interrelationship between mountain ecology and human activities and the interaction of mountains and lowlands. The programme focuses on developing interdisciplinary methods and systematic approaches to the management of complex mountain ecosystems that will help to combine the often conflicting objectives of conservation and development.

42. Within the framework of the above programme, there has been a continuous effort to develop methods for natural hazard mapping in mountain areas, analysing risks for landslides and other phenomena threatening human activities. Geographical information systems are utilized for this purpose. This is an ongoing activity within the programme.

7. Department of Technical Cooperation for Development

43. The Department's ongoing activities in the prevention and mitigation of disasters in the development and utilization of natural resources are as follows:

(a) Flood loss prevention. The Department has completed projects in Argentina, Bangladesh, Honduras, Nicaragua and Paraguay, which dealt with the development of models for flood mitigation, the establishment of flood warning systems, flood control in river basins, and designing systems to reduce flood damage in valleys. Several ongoing projects and programmes incorporate various aspects of disaster planning and preparedness, while other projects concentrate on post-disaster rehabilitation. A sample of ongoing projects covering flood and/or erosion issues include:

(i) Bangladesh. Protection of the left bank of the Brahamaputra River from erosion resulting from strong currents, especially during floods;

(ii) China. Assisting the Government in setting up a national centre to monitor the performance and impact (including flood control) of high dams using computer-based digital models and modern sensors and techniques;

(iii) India. Improving national capabilities for hydrographic surveying in major reservoirs and in developing measures to deal with sedimentation problems so as to prevent flooding possibilities;

(iv) Viet Nam. Examining the dynamics of coastal and ocean environmental protection and improving living conditions in coastal areas by planning for and mitigating adverse effects of beach erosion and typhoon and monsoon surges.

(b) Drought mitigation. A project in Somalia is rebuilding 10 walls in drought-prone areas to reduce livestock pressure on rangelands and to prevent overgrazing at single major water points. In the Sudan, an ongoing project is supplying equipment to be used in the construction of water points to serve the nomads in the eastern region.

(c) Publications:

(i) Guidelines for Flood Loss Prevention and Management in Developing Countries, Natural Resources/Water Series No. 5 (ST/ESA/45), 1/ addressed to persons involved with the formulation of programmes and policies for flood loss prevention and management in the context of regional and national development;

(ii) Flood Damage Prevention and Control in China, Natural Resources/Water Series No. 11 (ST/ESA/119), 2/ containing findings and recommendations of a workshop held in China, the objectives of which were to exchange information and experience with regard to methodological, technological and organizational approaches to the prevention and control of floods and to promote cooperation among developing countries in this area.

(d) Energy sector. Certain natural disasters, for example, floods, typhoons and tropical storms, often seriously damage electric power plants and transmission lines. The Department is assisting several countries in restoring their power systems. Activities include developing comprehensive information databases, early warning systems for possible damage to power systems, training of national staff and institutional strengthening to deal with such events, and integrating power sector disaster prevention and preparedness programmes into the national planning process in countries victimized by such occurrences.

(e) Minimization of environmental impacts in the production, transportation and storage of crude oil and petroleum products. An ongoing project in China is undertaking a marine engineering geological survey to strengthen the capabilities of the oil industry in oil spill prevention and control during oil production and transportation in the South China Sea.

44. The Department is also supporting projects on earthquake and landslide hazard assessment in Turkey and on appraisal of natural hazards along the Cameroon line financed by UNDP.

B. Specialized agencies

1. Food and Agriculture Organization of the United Nations

45. The activities of the Food and Agriculture Organization of the United Nations (FAO) in the field of disaster prevention and mitigation started in 1960 when specialists from WMO, UNESCO and FAO launched a large-scale agrometeorology project, which has so far published five surveys covering the Near East, the Sahelian zone, East Africa, the Andean zone and South-East Asia. Another survey on the humid low areas of South America is being carried out at the present time.

46. A climatic database was created in 1971 and now covers more than 3,000 stations in developing countries. Following the World Food Conference in 1974, agrometeorological crop monitoring was started in the Sahel and has now been extended to other African and Asian countries. The data generated from the above activities are used for monitoring disasters related to weather anomalies (drought and floods) that may have an impact on developing and utilizing land and water resources.

47. The Global Information and Early Warning System on Food and Agriculture monitors and reports on crop conditions and food supply in all developing countries. The Food Security Assistance Scheme assists countries in formulating national food security policies and programmes and in establishing and strengthening national and regional early warning and food information systems, thus contributing to disaster preparedness, prevention and management.

48. FAO, through its Fisheries Department, promotes national and international action for the rational development and management of world fisheries resources. Due attention is being given to such environmental factors as changes in atmospheric and oceanographic conditions which may adversely affect fishery resources, fishing fleets and fishing communities. The Department has also undertaken pre-disaster activities such as forecasting the potential yields of a number of fish stocks from available biological data and other information on fisheries.

49. Under the Tropical Forestry Action Plan, joint inter-agency and donor efforts coordinated by the FAO Forestry Department are aimed at reducing the negative impact of deforestation and thus preventing certain disasters. Such disasters as windstorms, floods, landslides, wild fires, tropical deforestation, desertification and drought are addressed by FAO through such prevention and mitigation measures as shelter-belt plantations, watershed management, afforestation and forest management, fire control, land use changes, fuel wood plantations, sand dune stabilization, utilization of alternative fuels and adoption of drought-resistant crops.

2. United Nations Educational, Scientific and Cultural Organization

50. Since 1960, UNESCO has been engaged in the assessment and mitigation of risks arising from natural hazards of geological origin (earthquakes, tsunamis, volcanic eruptions and landslides), and contributes to the study of hazards of hydrometeorological origin (storms, floods, prolonged droughts, desertification and avalanches).

51. The objectives of the Organization's activities in the field of natural disasters are the following: (a) to promote a better understanding of the distribution in time and space of natural hazards and of their intensity; (b) to set up reliable early warning systems; (c) to devise rational land-use plans; (d) to secure the adoption of suitable building design; (e) to protect educational buildings and cultural monuments; (f) to strengthen environmental protection for the prevention of natural disasters; (g) to enhance preparedness and public awareness through education and training; and (h) to foster post-disaster investigation, recovery and rehabilitation.

52. These activities are carried out through networking and strengthening of regional and international coordination systems, direct partnership with member States, field implementation of operational projects, reconnaissance and advisory missions, preservation and dissemination of data, seminars and training courses. Cooperation is maintained with competent international and non-governmental bodies. In implementing these activities, UNESCO performs under its regular programme and budget, and also as executing agency of specific projects financed by extrabudgetary sources, in particular UNDP, and trust funds.

53. The Intergovernmental Meeting on Seismology and Earthquake Engineering and the Intergovernmental Conference on the Assessment and Mitigation of Earthquake Risk, convened by UNESCO in 1964 and 1976 respectively, were the first large-scale international events to bring together specialists in seismology, earthquake engineering and the socio-economic aspects of earthquakes. The results of those two meetings were the main elements in forming the Organization's programme on earthquake hazards during subsequent years.

54. The main activities undertaken since 1960 include the establishment of international, regional and national centres, systems and networks for the exchange and analysis of earthquake data and training; identification of seismically active zones and the quantitative assessment of earthquake hazards in those zones; field studies of the effects of large earthquakes; and the training of specialists in seismology and earthquake engineering.

55. Examples of such activities include the following:

(a) The establishment of the International Institute of Seismology and Earthquake Engineering, Japan, 1963-1972, which, since 1964, annually trains scientists and engineers from different countries;

(b) The establishment of the Institute of Earthquake Engineering and Engineering Seismology, Yugoslavia, 1965-1978; international post-graduate training at the Institute has been sustained by UNESCO since 1979;

(c) The establishment of the International Seismological Centre, United Kingdom. The Centre uses one of the world's fastest computers to process the data it receives from observatories throughout the world and to produce its definitive bulletins of earthquakes;

(d) The establishment of the Regional Seismological Centre for South America (CERESIS), Peru. The Centre acts as a link between national seismological services and coordinates and executes regional studies of seismicity and earthquake risk;

(e) The establishment of the Regional Seismological Network in South-East Asia, 1973-1978, and the training of scientific and technical personnel to operate the network;

(f) Projects on the survey of seismicity and on earthquake risk reduction in the Balkan region, 1970-1976, 1980-1984 and 1988- . These projects brought together seismologists, geologists and engineers from six countries in a pioneering effort to define seismic risk on a regional basis and in terms directly applicable to earthquake-resistant design and construction, and to implement action towards the reduction of this risk. An important organizational output was the creation of a Permanent Coordinating Committee on Earthquake Risk Reduction in the Balkan Region, which is now operational;

(g) The feasibility study for the assessment and mitigation of earthquake risk in the Arab region, and the implementation of national projects in this region on training of personnel in seismology, engineering seismology, earthquake engineering and civil defence, 1982. This is being done in the framework of the Programme for Assessment and Mitigation of Earthquake Risk in the Arab Region. In relation to this programme, modern seismological networks, seismic hazards zonation, and earthquake-resistant building codes are being developed in the countries of the region;

(h) The initiation of a project on seismological recording and earth sciences studies in the African continent, 1990- ;

(i) Contribution to the cooperative project for seismic risk reduction in the Mediterranean region, 1990- ;

(j) The copying of historical seismograms and excavation of historical seismic data in selected regions, 1983- ;

(k) The establishment of a National Seismological Observatory Network, Romania, 1979-1982;

(l) The establishment of a strong-motion telemetry network and of an experimental site for earthquake prediction, in the Beijing region, China, 1981-1984;

(m) The modernization and reinforcement of seismological services, Viet Nam, 1987- ;

(n) The control of the seismic microzonation study in the El-Asnam region, Algeria, 1983-1984.

56. In the field of volcanic hazards, particular attention is being given to techniques for detecting and monitoring the phenomena preceding violent eruptions, and to problems of communication between scientists, civil defence services and the general public. Hence, two sets of general guidelines have been issued on volcanic hazards zonation and on volcanic emergency management.

57. At the request of the Governments of the countries concerned, short-term advisory missions of volcanologists have been sent, since 1963, to investigate volcanic crises. Specialized meetings are organized, as needed, to review past volcanic activity in specific regions and the status of volcanological surveillance. UNESCO has investigated problems, needs and solutions for training and research in volcanology in the western Pacific region.

58. In 1984, UNESCO completed a feasibility study on an International Mobile Early-warning System for Volcanic Eruptions (IMEWS), which has permitted the revision of existing volcano-monitoring facilities and the identification of 100 high-risk volcanoes in the world. It has laid the foundation of IMEWS, which operates on-the-site training at specific volcanoes, volcano monitoring, volcanic hazards mapping and expert reconnaissance missions. The Directory of Volcano Observatories, published annually by IMEWS, provides information on available scientific resources and contact points in member States.

59. International cooperation in tsunami warning was formally initiated by UNESCO in 1965. In that year, the Intergovernmental Oceanographic Commission (IOC) set up an International Tsunami Information Centre (ITIC), now located in Honolulu, which works closely with the Tsunami Warning System in the Pacific, operated by the United States.

60. IOC also established an International Coordination Group for the Tsunami Warning System in the Pacific (ITSU), which today numbers 23 member countries. Convened biennially since 1968, ITSU meetings provide an opportunity for member States to examine together means for tsunami preparedness and risk mitigation.

61. Two regional tsunami warning centres were established in the Pacific, one in Alaska and the other in Hawaii, which deal with tsunami warnings in the northern part of the Pacific. Among the major efforts foreseen by ITSU is the development of a subregional tsunami warning system in the south-west Pacific.

62. Various studies have been conducted by UNESCO on the cause and prevention of landslides, in particular the publication of guidelines on landslides hazards zonation. The United Nations Environment Programme (UNEP)/UNESCO project on the protection of the lithosphere as a component of the environment (1981-1984) resulted in significant multinational landslide research and mitigation. The project sponsored international workshops and seminars and published research and mitigation studies that have proved significant in landslide risk reduction.

63. During the International Hydrological Decade (1965-1974) and under the International Hydrological Programme (IHP), which developed in several phases, considerable attention has been given to hydrological hazards. The hydrological processes of these phenomena, including river floods and flood-risk assessment, had been studied, as well as the management and prevention aspects. This is part of the Organization's Water Science Programme, whose aim is to improve the assessment, planning and management of the world's water resources.

64. The publications of UNESCO on this subject include the World Catalogue of Very Large Floods and a work entitled Floodflow Computation, which contains a compilation of the methods employed in computing the magnitude and frequency of large floods, with particular reference to the use of such methods in the design of engineering works for flood control.

65. Field studies of catastrophic floods are made by UNESCO scientific missions. A number of countries have requested assistance in connection with problems related to floods, flood forecasting and resulting effects, including Brazil for the City of Rio de Janeiro, Peru for the Andes valley and Cuzco area, and Yemen for flood prevention in Wadi Hadhramaut. A mathematical model of the Mekong Delta was built for flood warning, and a study of flood control in the Pantanal region of Brazil was carried out.

66. Studies on drought and desertification were undertaken in the framework of the International Hydrological Decade and IHP and the Man and Biosphere (MAB) Programme, which started in 1971. A special IHP technical report was devoted to improving the understanding of the relationship between climate variability and drought. In 1977, a map of the world distribution of arid regions and a set of case-studies on desertification were prepared for the United Nations Conference on Desertification, held at Nairobi in the same year. Hence, arid land studies, including drought and desertification problems, have been given an important place in MAB activities. These studies are undertaken in the framework of integrated pilot projects aimed at better understanding the functioning of arid and semi-arid ecosystems and at devising optimal land-use systems in drought-prone areas, thus contributing to combating desertification in these areas. Such projects were developed in particular in Africa (Sahelian countries, Kenya, Lesotho and Tunisia). A large number of scientific publications and guidelines, tailored to decision makers and the general public, have emanated from these projects, including poster and audio-visual series.

67. Various studies on the cause and prevention of land subsidence have been conducted within the framework of the International Hydrological Decade and, since 1975, of IHP and the International Geological Correlation Programme (IGCP). Two IGCP projects, sea-level correlation and applications, 1983-1987 and coastal evolution in the Quaternary, 1988-1992, are particularly related to dangers arising from the subsidence of lowland plains. The Major Interregional Project on Research and Training Leading to the Integrated Management of Coastal Systems (COMAR) considers the relationship between the global-related mean sea-level change and natural hazards such as the flooding of low-lying coast and the impact of tsunamis on the coastal zones.

3. World Meteorological Organization

68. The two natural resources that are fundamental to life on this planet are air and water, and WMO has major responsibilities for both. Knowledge of the atmosphere and of freshwater resources depends upon the sciences of meteorology and hydrology and their applications, particularly through the activities of the world's meteorological and hydrological services. Weather and climate are often thought of as resources in the same way that the fresh waters of the globe are considered, but they can also be thought of in terms of the natural hazards their vicissitudes generate such as tropical cyclones, floods and drought.

69. The atmosphere, its composition and circulation, its interaction with the hydrosphere, heat transfer, solar radiation and the water cycle are the subject of continuous monitoring, analysis and forecasting activities carried out by WMO members under various programmes such as the World Weather Watch (WWW), the Global Atmosphere Watch (GAW), the Integrated Global Ocean Services System (IGOSS) (together with IOC), and the Tropical Cyclone Programme (TCP). Since 1963, the WWW system has provided the global operational structures for this enormous task, which comprises regular observations, real-time data collection and exchange and processing at the global, regional and national levels. Many of these activities are aimed at the assessment of short-term developments, including those relating to acute emergencies such as tropical cyclones and massive releases of hazardous materials (nuclear or chemical), which are of vital importance for the use of the natural resource air in various fields of application.

70. The objectives of the WMO Tropical Cyclone Programme are to promote and facilitate coordinated and cooperative action at the international, regional and national levels to provide upgraded and more effective warnings of tropical cyclones and associated floods and storm surges (project 18.3), and the dissemination of warnings, together with strengthening the related community preparedness for the mitigation of loss of life, human suffering, destruction of property and the set-back to social and economic development, particularly in developing countries (projects 18.5 and 18.6). WMO disaster prevention and preparedness activities are usually conducted in cooperation with other agencies, such as UNDRO, the League of Red Cross and Red Crescent Societies, and the regional commissions.

71. The WMO arrangements to respond to nuclear or other environmental emergencies comprise the real-time exchange of monitoring data needed for the assessment of the emergency situation and regular short-range predictions of the transport, deposition or dispersion of hazardous materials. This system is established as part of the emergency response under the International Atomic Energy Agency (IAEA) Convention on Early Notification and Assistance in Case of Nuclear Accidents or Emergencies, but is also applicable to other types of environmental disasters, making use of the observing, telecommunications and data-processing capabilities of the WWW system.

72. The WMO Global Atmosphere Watch was introduced as an "umbrella" system in 1989 to integrate the many monitoring and research activities involving the measurement of chemical composition and physical characteristics of the atmosphere. It serves

as an early warning system to detect further changes in atmospheric concentrations of greenhouse gases, changes in the ozone layer and in the long-range transport of pollutants, including acidity and toxicity of precipitation, as well as the atmospheric burden of aerosols and the radiation balance. GAW will facilitate the prediction of future states of the atmosphere and related earth systems and will be a framework to plan, design, advise, coordinate and scientifically evaluate global atmospheric-composition monitoring activities that will affect decisions on the environment in the twenty-first century.

73. Solar energy and wind energy are other forms of natural resources used for power production without pollution and greenhouse side-effects. Through its Weather Prediction Research and Tropical Meteorology Research Programmes, WMO assists the national and regional activities needed to evaluate these forms of resources, in relation to their location, duration, intensity and reliabilities. These activities include diagnosis and prediction of weather systems and analysis of the weather situation and historical records to give reliable forecasts of weather phenomena favourable to generate solar and wind energy.

74. The use of these types of resources is subject to the following risks: (a) drought, as a result of long periods of fine weather with immense solar energy, especially in the tropics; and (b) flooding, as a result of tornadoes, severe thunderstorms and tropical cyclones associated with high wind energy.

75. The work of WMO in the field of weather prediction research and tropical meteorology provides useful information for national and regional efforts to minimize these risks. It is well understood that climate variations are one of the primary causes of natural hazards such as drought or insect infestation (e.g., locusts).

76. Climate and its variability affect many aspects of socio-economic developments, and are usually considered as given environmental conditions that should be studied, monitored, accounted for, adapted to and, eventually, used in the most profitable way. Hence, an appraisal of climate as a natural resource may now be subject to significant change. It is the speed of change that could in the future be considered a hazard, since neither ecological nor socio-economic systems would be able to adapt to it without serious losses. To assess the potential impact of climate change and that of changes of magnitude and probability of associated meteorological hazards, regional details of climate change should be known.

77. To that end, at the international level, WMO is involved in all aspects of the climate change issue. Together with UNEP, WMO established the Intergovernmental Panel on Climate Change (IPCC). The first report of IPCC included an assessment of available scientific information on climate change, an assessment of environmental and socio-economic impacts of climate change and the formulation of options for response strategies.

78. When assessing available scientific information on climate change, special attention is being paid to the questions of regional distribution of climate change and of extreme events such as tropical storms. The existing model disagreements

with respect to regional and smaller-scale predictions are analysed with a view to clarifying the underlying reasons for such disagreements.

79. WMO promotes the participation of developing countries in global climate change studies and related environmental issues. A resolution on this subject, which was adopted by the Executive Council of WMO at its forty-first session, in 1989, recognizes the importance of enabling the developing countries to enhance their scientific appreciation of the physical basis for climate change, to better comprehend the potential impacts of climate change and be adequately informed for assessing practical response strategies. A programme of information transfer to the developing countries on the issues of climate change, addressed to scientists, the public at large and policy decision makers, is an essential part of WMO activities in this area.

80. Water is a basic resource used for drinking, for the production of food, for waste disposal, power production, transport and the like. Through its Hydrology and Water Resources Programme, WMO promotes the national and regional activities required to assess this resource, in particular the location, magnitude, quality and reliability of water supplies. These activities involve the collection, storage and analysis of data and the provision of the hydrological forecasts required to ensure the optimum operation of water resource projects.

81. The development and use of water resources is subject to three types of risk:

(a) Flooding as a result of an excess of water;

(b) Drought as a result of a shortage of water;

(c) Man-made disasters as a result of inadequately designed works (e.g., a dam breaks) or incorrect procedures (e.g., accidental pollution).

82. The work of WMO in the field of hydrology provides support for national efforts to minimize all three risks. Technical guidance is developed on the forecasting of floods and on the monitoring of drought periods. Advice is offered on the means of estimating the risk of such natural disasters and the action that can be taken to reduce their impact. Much of the same technology is also appropriate in alleviating the risks and impact of man-made disasters.

83. The activities of WMO in relation to hydrology and water resources do not only include the provision of guidance and advice to member States, but also a system for the international transfer of appropriate proven technology and, with the support of UNDP and various donors, the implementation of a wide range of technical cooperation projects in developing countries. These contribute at the same time to the implementation of both the Mar del Plata Action Plan and the International Decade for Natural Disaster Reduction.

4. World Health Organization

84. The responsibility of the World Health Organization (WHO) in disaster reduction is an integral part of its mandate, which has long stressed the importance of preventive measures and emergency preparedness, and reaffirms the role of WHO as the lead United Nations agency in the health aspects of disaster preparedness. Moreover, WHO gives priority to linking disaster reduction measures to long-term development activities, which ultimately strengthen the health preparedness and response capabilities of its member States.

85. With respect to the development and utilization of natural resources and the health aspects of disaster mitigation, several clear technical links can be identified:

(a) Adequate sanitation and safe water supply is one of the cornerstones of primary health care. WHO has long given technical priority to the development of community water supplies in developing countries. The recent cholera outbreak in Peru underscores the importance of adequate urban and rural water supply systems that minimize the transmission risk of water-borne diseases;

(b) Solar energy is necessary for essential health equipment. The availability of solar-powered refrigerators and short-wave radios provides a key support for country-based responses in disasters of all kinds. Outlying rural areas must often cope with erratic supplies of kerosene and electricity. In this situation, when health workers, as frontline responders to meningitis epidemics or population displacements, depend on reliably refrigerated vaccines, solar-powered equipment can play a critical role. Similarly, solar-powered short-wave radios allow health services to provide essential information, in both the initial and the relief phases of natural or other disasters;

(c) Earthquake and wind-resistant construction techniques are needed. Vast experience has shown that health facilities should be constructed in such a way that they could support their communities during disasters of all kinds. During the Mexico earthquake in 1985, more than 5,000 hospital beds were lost. Hazard-resistance is increasingly a criterion that must be incorporated into the design of health facilities and hospitals.

86. WHO recognizes that the above measures not only help to minimize the impact of disasters, but also complement and strengthen existing health services.

5. World Bank

87. Increasingly, the World Bank initiatives in this area are aimed at strengthening preventive measures to protect future development projects from potential catastrophes and to arrest environmental degradation that could spark further natural disasters. In June 1990, the Bank convened a Colloquium on Disasters, Sustainability, and Development: A Look to the 1990s, bringing together specialists in development, natural disasters and the environment to share experiences in disaster prevention, mitigation, response and reconstruction, and to

consider strategies for reducing the devastating impact of natural hazards in the 1990s. Specifically, the colloquium examined the ability of societies to organize and cope with potentially slow-acting but progressive disasters, such as sea-level rise or drought arising from global climate change, and discussed ways of improving resilience in disaster-prone developing countries.

88. The Bank and the United Nations Centre for Human Settlements (Habitat) are collaborating on a joint proposal on disaster prevention and mitigation in metropolitan areas. The objective of the project is to help reduce the vulnerability of metropolitan areas to extreme events and to address the urgent need for a better understanding of disaster prevention and mitigation in disaster-prone developing countries.

89. The Bank has also expanded its research in this area.

6. International Maritime Organization

90. The International Maritime Organization (IMO) has developed an international strategy to facilitate cooperation among Governments to protect the marine environment from pollution from ships and related activities. One of the objectives of the strategy is to strengthen the capacity of countries, in particular the developing countries, to take national and regional action in response to environmental threats.

91. Coastal and marine resources, including fisheries, tourist facilities and port and shipping installations, need to be developed in an environmentally sound and sustainable manner, which can only be brought about through international cooperation. The IMO strategy provides the necessary framework for such cooperation by promoting the adoption and implementation of international standards and measures to prevent marine pollution, as well as the dumping of wastes, from ships.

92. The principal international instruments containing norms and standards to prevent ship pollution and the dumping of wastes at sea are the International Convention for the Prevention of Pollution from Ships and the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, as amended.

93. In addition, the following measures may be available to coastal States under the IMO strategy:

(a) Assessment of the extent to which the coastline of a particular country is affected by marine pollution;

(b) Research and development of viable solutions to marine pollution problems, where possible reflecting local technological capabilities and indigenous material and expertise;

(c) Formulation of national policies and adoption of relevant legal provisions to implement applicable international rules and standards;

(d) Prevention and clean-up measures, including the installation of different kinds of pollution combating equipment, enforcement of regulations and training of clean-up teams.

94. In developing and implementing the above measures, IMO seeks at all times to ensure appropriate cooperation with relevant international and regional organizations, including the organizations and bodies of the United Nations system. IMO is fully aware that wasteful duplication must be avoided and that the protection of the environment can only be achieved through a coordinated approach of all parties concerned.

7. International Fund for Agricultural Development

95. The International Fund for Agricultural Development (IFAD), which has the specific mandate of rural poverty alleviation, funds agricultural and rural development projects in developing countries. In its efforts to target the poorest populations in rural areas the Fund has increasingly focused on marginal agro-ecological areas where the links between natural resource degradation and poverty are quite severe. The Fund seeks to assist small farmers in their transition to more sustainable production systems. By emphasizing interventions that are compatible with the constraints imposed by fragile natural resources, the Fund seeks to minimize the vulnerability of small farmers to environmental shocks and natural disasters and limit the resource pressures that give rise to disequilibria in agro-ecosystems. In this way, the welfare impacts of natural disasters are mitigated.

96. Examples of IFAD activities that are especially relevant in this regard include the following: in Africa, the Special Programme for Sub-Saharan African Countries Affected by Drought and Desertification, in which the main thrust has been the introduction of environmentally sound and sustainable agricultural technologies (based on traditional systems); in Asia, the Small-scale Flood Control Project in Bangladesh, which has assisted in building embankments and regulatory water control structures and drainage facilities to eliminate flooding in low-lying areas; in the Islamic Republic of Iran, through a joint project with the Office of the United Nations High Commissioner for Refugees (UNHCR), IFAD has initiated the South Khorasan Rangeland Rehabilitation and Refugee Income-generating Project, which is serving to mitigate a potential disaster situation, owing to the influx of a large number of refugees from across the border; in the Near East and North Africa, natural disasters owing to the pressure of refugee populations crossing international borders has been averted by IFAD interventions in Mauritania and Algeria, which have helped in the resettlement of refugees and in the provision of gainful employment.

97. In addition to investment project interventions in natural resource management, the Fund, through its Technical Assistance Grant Programme, has supported applied research and development in addressing desert locusts, the cassava mealybug infestation and, more recently, the new world screwworm infestation in North Africa.

Notes

1/ United Nations publication, Sales No. E.76.II.A.7.

2/ United Nations publication, Sales No. E.82.II.A.13.

Annex

Synoptic table of the potential of organizations and agencies to contribute to disaster prevention and mitigation in developing and utilizing natural resources

Organization	Type of hazard						
	Floods	Cyclones/ tsunamis	Earthquakes and volcanic eruptions	Drought and desertification	Industrial and nuclear accidents	Landslides and avalanches	Ecological and health hazards (water/air quality)
DTCD	X	X	X	X	X	X	X
UNDP	X			X			X
UNEP				X			X
UNU			X		X	X	
ECA				X			
ECE	X		X		X		X
ECLAC	X		X				
ESCAP	X	X	X	X	X	X	X
ESCWA							
UNCHS (Habitat)	X		X		X	X	X
UNDRO	X		X		X	X	X
WFP	X	X				X	
ILO							X
FAO	X			X		X	
UNESCO	X	X	X	X		X	
WHO							X
WMO	X	X		X	X		X
IMO							X
IFAD	X			X			
UNIDO			X		X		
IAEA	X	X	X		X	X	
WORLD BANK	X	X		X			